

This is a repeat of comments I originally filed a month ago. The comments do not appear in the current database, so I am re-submitting them as late comments.

Use of unshielded power line systems for transmission of high speed data will cause harmful interference to most licensed services in the HF spectrum, including airline navigation and amateur radio emergency communications. This is well documented in the comments filed by the ARRL as well as in overseas tests of HF power line communications, summarized in these CE magazine on line articles:

<http://ce-mag.com/archive/03/ARG/hansen1.html>

<http://ce-mag.com/archive/03/ARG/hansen2.html>

The potential for interference is particularly troublesome because HF emissions do not respect national borders. Ionospheric propagation will inflict the greatly increased noise floor caused by these systems upon other countries thousands of miles away.

A second major concern is that these systems will be extremely susceptible to interference received from licensed users of the spectrum. Assuming -17dB radiation efficiency (as documented by Hare at ARRL), the effective aperture area of the powerline at 7.5MHz would be $(40m \times 40m) / (4 \times \pi)$ less 17dB, which is 2.55 square meters. At the 3V/m field strength required for "CE" marking, the received power would be

$(3V/m \times 3V/m \times 2.55 \text{ square meters}) / (120 \times \pi \text{ ohms})$, which is 61mW or 18dB above a milliwatt. The field strength in uncontrolled areas around amateur stations may be more than 20dB higher than the CE test level, 38dB above a milliwatt. Such received signal levels are likely to cause severe overload of the power line communication receivers, making them useless when there is a licensed station anywhere near the transmission line. Such close proximity is unavoidable in densely populated areas.

The potential for interference is made worse by the emissions from the PLC system. This interference increases the "minimum power necessary" to maintain communications for licensed stations, especially stations in the Amateur Radio Service. Amateur licensees will need to use maximum authorized power more frequently to overcome the increased noise levels. The Japanese tests have shown that only stations having the highest possible signal strengths can be heard in areas where broadband PLC systems operate. Voluntary use of low power will become an historical artifact if the HF noise floor increases by 20 to 30dB, as documented in the CE magazine articles.